



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/702,379	10/31/2000	Ronald A. Askeland	10002282-1	5283

7590 04/18/2006
Hewlett-Packard Company
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

PARK, CHAN S

ART UNIT	PAPER NUMBER
----------	--------------

2625

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/702,379

Applicant(s)

ASKELAND ET AL.

Examiner

CHAN S. PARK

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

DOUGLAS Q. TRAN
PRIMARY EXAMINER

Traveling

Chan S. Park

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment was received on 1/31/06, and has been entered and made of record. Currently, **claims 1-20** are pending.

Response to Arguments

2. Upon review of the references of *Askren* (U.S. Patent No. 6,350,004) and *Haselby* (U.S. Patent No. 5,644,344), which were cited in the Office Action dated 11/21/05 under 35 U.S.C. 103(a), as being obvious, the examiner notes that the references can still be interpreted to maintain the rejections, as currently amended.

In response to applicant's argument regarding the rejection of claim 1, wherein on pages 6-9, the applicant explains how the current invention differs from the teachings of *Askren* and *Haselby*. Particularly, the applicant states that the prior art references fail to teach a correction scheme for compensating for defective ink drops including spear drops. Further, the applicant states that "*it is known that spear drops are a phenomenon that occurs at a relatively high firing rate*". It is noted that both *Askren* and *Haselby* are directed to the ink jet printer including the driver head for adjusting firing frequency for adjusting blurry image or text (col. 5, line 24 of *Askren* & col. 11, lines 63-66 of *Haselby*). Particularly, *Haselby* teaches the method of compensating/correcting the defective drops which were fired at relatively high firing rate (col. 6, lines 40-45 & col. 10, lines 36-47). Now, by the applicant's own admission, the defective drops fired at the high frequency (figs. 3 & 6 of *Askren*), would naturally include the spear drops

Art Unit: 2625

because it is a known phenomenon. Since *Haselby* particularly corrects this swath data occurred at the high firing frequency, the examiner believes that the step of compensating the defective drops, which includes the spear drops, is taught by the prior art. The claim wording is not apparent to distinguish whether the correction scheme only compensates the defective drops or the defective drops and the spear drops.

With respect to claim 2, one of ordinary skill in the art would have expected Applicant's invention to perform equally well with the compensating the defect drops of *Askren* and *Haselby* because the system of *Haselby*, particularly, corrects the defective drops which may occur at any particular frequency by adjusting the firing frequency. Therefore, it would have been obvious to one of ordinary skill in this art to modify the threshold frequency to be approximately 38 kilohertz to obtain the invention as specified in claim 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Askren* U.S. Patent No. 6,350,004 in view of *Haselby* U.S. Patent No. 5,644,344.

3. With respect to claim 1, *Askren* discloses a printhead for correcting systematic printing errors (fig. 1) comprising:

an inkjet ejection driver head (14) having a distributive processor (18) integrated within the ink ejection driver head; and

a correction scheme programmed into distributive processor, wherein the correction scheme includes intentionally misaligned the ejected ink drops to compensate for known systematic ink drop printing errors (col. 5, line 46 – col. 6, line 57).

Askren does not explicitly state that the defective drops are ejected when the driver head fires above a threshold frequency.

Haselby, the same field of endeavor of compensating/correcting the skew line in the printing art, discloses a printer controller for intentionally adjusting the firing frequency of the driver head to correct the swath data error (col. 6, lines 17-57) occur at any particular frequency.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the firing frequency adjustment of Haselby into the printhead of Askren.

The suggestion/motivation for doing so would have been to correct the swath data error by intentionally adjusting (hence, misaligning with respect to the previous error data) the firing frequency.

Therefore, it would have been obvious to combine Askren with Haselby to obtain the invention as specified in claim 1.

1. With respect to claim 2, Askren discloses the printhead, wherein the correction scheme corrects systematic ink drop replacement errors of the printhead (col. 5, line 46

– col. 6, line 57), wherein the defective drops are comprised of spatter drops with tail artifacts (figs. 5-9).

The combination of Askren and Haselby, however, does not explicitly disclose that the threshold frequency is approximately 36 kilohertz.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include/modify the threshold frequency to be approximately 36 kilohertz. Applicant has not disclosed that the threshold frequency of 36 kilohertz provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the compensating the defect drops of Askren and Haselby because the system of Haselby, particularly, corrects the defect drops which may occur at any particular frequency by adjusting the firing frequency.

Therefore, it would have been obvious to one of ordinary skill in this art to modify the threshold frequency to be approximately 38 kilohertz to obtain the invention as specified in claim 2.

2. With respect to claim 3, Askren discloses the printhead, further comprising a general correction scheme generated during manufacturing of a class of inkjet printheads (col. 5, lines 55-57).

3. With respect to claim 4, Askren discloses the printhead, wherein the general correction scheme includes corrections that cover additional errors that exist (col. 5, line 65 – col. 6, line 35).

Art Unit: 2625

4. With respect to claim 5, Askren discloses the printhead, further comprising a general correction scheme generated during manufacturing of individual inkjet printheads (col. 5, lines 55-57).

5. With respect to claim 6, Askren discloses the printhead, wherein the general correction scheme includes corrections that cover additional errors that exist (col. 5, line 65 – col. 6, line 35).

6. With respect to claim 7, Askren discloses the printhead, wherein the correction scheme is controlled by a printer driver as software operating on a computer system that is connected to the printhead (col. 6, lines 31-35).

7. With respect to claim 8, Askren discloses the printhead, wherein the correction scheme is preprogrammed as firmware and incorporate into a controller connected to the printhead (col. 6, lines 31-35).

8. With respect to claim 9, Askren discloses the printhead, wherein the correction scheme is encoded on a memory device incorporated into printhead (col. 6, lines 38-31).

9. With respect to claim 10, Askren discloses the printhead, wherein the correction scheme is generated at the time of at least one of printhead manufacturing or printhead operation (col. 5, lines 46-64).

10. With respect to claim 11, Askren teaches a method for correcting systematic printing errors of an inkjet printhead, comprising:

determining systematic errors that are associated with the printhead with an ink ejection driver head having a distributive processor integrated within the ink ejection driver head (col. 5, line 55 – col. 6, line 13);

recording and storing the systematic errors (col. 5, line 55 – col. 6, line 13);

generating a correction scheme to correct the systematic errors (col. 5, line 55 – col. 6, line 13); and

applying the correction scheme to the printhead during printing operations, wherein the correction scheme includes intentionally misaligning the ejected ink drops to compensate for known systematic ink drop printing errors (fig. 1 & col. 6, lines 28-57).

Askren does not explicitly state that the defective drops are ejected when the driver head fires above approximately 36 kilohertz. However, it is obvious to one of ordinary skill in the art that the driver head ejects defective drops at a particular frequency.

Furthermore, Haselby, the same field of endeavor of compensating/correcting the skew line in the printing art, discloses a printer controller for intentionally adjusting the firing frequency of the driver head to correct the swath data error (col. 6, lines 17-57) occur at any particular frequency.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the firing frequency adjustment of Haselby into the printhead of Askren.

The suggestion/motivation for doing so would have been to correct the swath data error by intentionally adjusting (misaligning with respect to the previous error data) the firing frequency.

Moreover, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include/modify the threshold frequency to be approximately 36 kilohertz. Applicant has not disclosed that the threshold frequency of 36 kilohertz provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the compensating the defect drops of Askren and Haselby because the system of Haselby, particularly, corrects the defect drops which may occur at any particular frequency by adjusting the firing frequency.

Therefore, it would have been obvious to combine Askren with Haselby to obtain the invention as specified in claim 11.

11. With respect to claim 12, Askren teaches the method, wherein the correction scheme is generated as a compensation operation that corrects alignment ink drop errors by instructing the printhead to strategically misaligning the ink drops during normal operation of the printer (fig. 1 & col. 6, lines 28-57).

12. With respect to claim 13, Haselby teaches the method wherein determining system errors includes determining odd/even alignment offsets for the printhead (col. 4, lines 9-29)

13. With respect to claim 14, Askren teaches the method, wherein generating a correction scheme includes printing an alignment plot, examining the alignment plot to

Art Unit: 2625

determine the correct alignment for main ink drops and storing the correct alignment in a memory device, wherein examining the alignment plot includes at least one of automatically examining the plot with an alignment sensor or manually examining the plot by a user (col. 5, lines 46-64).

14. With respect to claim 15, Askren teaches the method, further comprising, before a printing operation, reading the systematic errors and using the correct alignment data to eject ink drops during a printing operation that are intentionally misaligned to compensate for the systematic errors (col. 6, lines 28-35). Note that the determination is done for both odd/even firing groups/pixels.

15. With respect to claim 16, Askren teaches the method, wherein generating a correction scheme includes firing droplet and examining the droplets during flight to determine the correct alignment for main ink drops and storing the corrected alignment in a memory device (col. 5, lines 46-64).

16. With respect to claim 17, Askren teaches the method, further comprising, before a printing operation, reading the systematic errors and using the correct alignment data to eject ink drops during a printing operation that are intentionally misaligned to compensate for the systematic errors (col. 6, lines 28-35).

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Askren in view of Haselby and in further in view of Fujita et al. U.S. Patent No. 6,733,100 (hereinafter Fujita).

17. With respect to claim 18, Askren discloses an inkjet printing system (fig. 1) comprising:

a controller (11);

a printhead assembly (14) in communication with the controller and having a distributive processor (18) integrated with an ink ejection driver head; and

wherein the distributive processor is preprogrammed with a correction scheme that selectively prints ink drops as intentionally misaligned ink drops to compensate for known systematic ink drop errors as instructed by the controller for correcting printed artifacts (col. 5, line 46 – col. 6, line 35).

Askren does not explicitly state that the defective drops are ejected when the driver head fires above a threshold frequency. However, it is obvious to one of ordinary skill in the art that the driver head ejects defective drops at a particular frequency and that frequency is above a threshold frequency (i.e. 0 kilohertz).

Furthermore, Haselby, the same field of endeavor of compensating/correcting the skew line in the printing art, discloses a printer controller for intentionally adjusting the firing frequency of the driver head to correct the swath data error (col. 6, lines 17-57) occur at any particular frequency.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the firing frequency adjustment of Haselby into the printhead of Askren.

The suggestion/motivation for doing so would have been to correct the swath data error by intentionally adjusting (misaligning with respect to the previous error data) the firing frequency.

The combination of Askren and Haselby, however, does not expressly disclose that the printhead assembly is in bi-directional communication with the controller.

Fujita, the same field of endeavor of compensating the printhead alignment error, discloses an inkjet system comprising:

a controller (figs. 7 & 8); and

a printhead assembly (figs. 4 & 5) in bi-directional communication with the controller and having a distributive processor integrated with an ink ejection driver head (col. 7, lines 7-22 and col. 19, lines 3-58).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the bi-directional communication system of Fujita into the printhead error compensating system of Askren.

The suggestion/motivation for doing so would have been to notify the controller of any errors at the printhead for the appropriate adjustment.

Therefore, it would have been obvious to combine three references to obtain the invention as specified in claim 18.

18. With respect to claim 19, Askren discloses the printing system, further comprising an ink supply providing ink to the printhead assembly (col. 3, lines 50-52). Also refer to fig. 4 of Fujita.

19. With respect to claim 20, Askren discloses the printing system, further comprising:

a media moving mechanism (col. 3, lines 55-57); and

a printhead support mechanism that supports the printhead assembly in relation to the media moving mechanism (col.3, lines 55-61).

Furthermore, Fujita discloses a media moving mechanism (col. 6, lines 33-51); a printhead support mechanism that supports the printhead assembly in relation to the media moving mechanism (M4001); and a removable ink supply container (H1900) fluidically coupled to the printhead assembly for providing ink to the ink ejection driver head (fig. 4).

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2625

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAN S. PARK whose telephone number is (571) 272-7409. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

csp
April 14, 2006

Chan S. Park
Examiner
Art Unit 2625

Chan S. Park

DOUGLAS Q. TRAN
PRIMARY EXAMINER

Douglas Q. Tran